

## Claims

### What is claimed is:

1     1. A pulse valve (24, 124, 122) for providing high  
2     frequency pulses of a fluid medium, comprising:  
3         a housing (50; 140, 140'; 240, 240') containing  
4     a plenum chamber (74, 174, 274);  
5         means (76, 78, 178, 278) for supplying the  
6     fluid medium under pressure to the plenum chamber (74,  
7     174, 274);  
8         a pair of members (40, 42; 140, 142; 240, 242)  
9     mutually juxtaposed in close, facing relation and  
10    having respective slots (44, 46; 144, 146; 244, 246)  
11    therein, one member (42, 142, 242) of the pair of  
12    slotted members (40, 42; 140, 142; 240, 242) being  
13    adapted to rotate relative to the other (40, 140, 240)  
14    to successively align and unalign, and thus port and  
15    unport, the slots (44, 46; 144, 146; 244, 246) in the  
16    two members, the pair of members (40, 42; 140, 142;  
17    240, 242) defining a boundry of the plenum (74, 174,  
18    274); and  
19         means (70, 54, 52; 194) for rotatingly driving  
20    one member (42, 142, 242) of the pair relative to the  
21    other (40, 140, 240) at a predetermined speed to  
22    provide successive pulses of the fluid medium at the  
23    high frequency.

1     2. The pulse valve (24) of claim 1 wherein the pair of  
2     slotted members (40, 42) comprise a stationary member  
3     (40) fixedly mounted in the housing (50), and a disk  
4     (42) rotatably mounted in the housing (50) adjacent to  
5     and upstream of the stationary member (40) relative to  
6     the direction of the supply of the fluid medium to the  
7     plenum chamber (74), the rotatable disk (42) being  
8     mounted to allow limited axial displacement whereby the

9 pressure of the fluid medium urges the rotatable disk  
10 (42) into close sealing relation with the stationary  
11 member (40).

1 3. The pulse valve (24) of claim 2 including spring  
2 means (72) operatively disposed for urging the  
3 rotatable disk (42) relatively toward the stationary  
4 slotted member (40) to enhance the relative seal  
5 between the disk (42) and the stationary slotted member  
6 (40).

1 4. The pulse valve (24) of claim 3 wherein the  
2 rotatable disk (42) includes an axially located, shaped  
3 seating recess (71'), and the means (70, 54, 52) for  
4 rotatingly driving the disk (42) comprise a rotary  
5 motor (52), a drive shaft (54) connected to the motor  
6 (52) and a shaped driver (70), the drive shaft (54)  
7 including a shaped recess (68) extending axially in its  
8 distal end, the proximal end of the shaped driver (70)  
9 being slidably disposed in the shaped recess (68) of  
10 the drive shaft (54) and shaped to prevent rotation  
11 relative to the drive shaft (54), the distal end of the  
12 shaped driver (70) including a shaped head (71), the  
13 shaped head (71) and the shaped seating recess of the  
14 rotatable disk (42) being cooperatively shaped for  
15 mated rotary driving engagement and limited floating  
16 axial and wobble displacement of the rotatable disk  
17 (42), and wherein the spring means (72) comprise a  
18 compression spring disposed in the shaped recess (68)  
19 of the drive shaft (54) and acting on the shaped driver  
20 to bias its shaped head (71) into the shaped seating  
21 recess of the rotatable disk (42).

1     5. The pulse valve (24) of claim 3 wherein the fluid  
2     medium is a gaseous propellant for a pulse detonation  
3     engine (10), the opposed facing faying surfaces of the  
4     fixed member (40) and the rotatable disk (42) are  
5     ground to precision flatness and finish, and the number  
6     of slots (44 or 46) in at least one of the fixed member  
7     (40) and the rotatable disk (42) is at least about ten.

1     6. The pulse valve (24, 122, 124) of claim 1 wherein  
2     the pair of slotted members (40, 42; 140, 142; 240,  
3     242) comprise a stationary member (40, 140, 240)  
4     fixedly mounted relative to the housing (50; 140, 140';  
5     240, 240') and a disk (42, 142, 242) rotatably mounted  
6     relative to the housing (50; 140, 140'; 240, 240') and  
7     adjacent to the stationary member (40, 140, 240), the  
8     rotatable disk (42, 142, 242) being mounted to allow  
9     limited axial displacement, and including spring means  
10    (72, 172) operatively disposed for urging the rotatable  
11    disk (42, 142, 242) relatively toward the stationary  
12    slotted member (40, 140, 240) to enhance relative  
13    sealing between the disk (42, 142, 242) and the  
14    stationary slotted member (40, 140, 240).

1     7. The pulse valve (24, 122, 124) of claim 6 wherein  
2     the fluid medium is a gaseous propellant for a pulse  
3     detonation engine (10), the opposed facing faying  
4     surfaces of the fixed member (40, 140, 240) and the  
5     rotatable disk (42, 142, 242) are ground to precision  
6     flatness and finish, and the number of slots (44, 46;  
7     144, 146; 244, 246) in at least one of the fixed member  
8     (40, 140, 240) and the rotatable disk (42, 142, 242) is  
9     at least about ten.